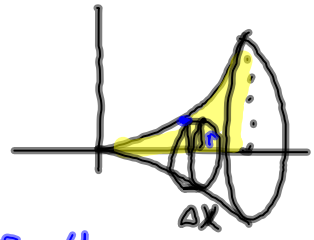
7.3 volumes of revolution

$y = x^2$ $x = 0$ (a), $x = 3$ (b), x axis



$r = y = x^2$

$\Delta V_i = \pi r_i^2 \Delta x$

$\hookrightarrow V \approx \sum_{i=1}^{n} \pi r_i^2 \Delta x$ n disks

$V = \lim_{\Delta x \to 0} \sum_{i=1}^{n} \pi r_i^2 \Delta x$

method of disks

$\int_0^3 \pi x^4 dx =$

$V = \int_a^b \pi r^2 dx$ r is some function of x

Jan 19-11:21 AM

area bounded by:

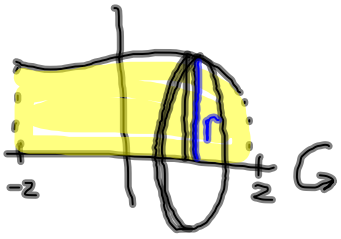
✓ $y = 2 + x\cos x$

✓ x-axis

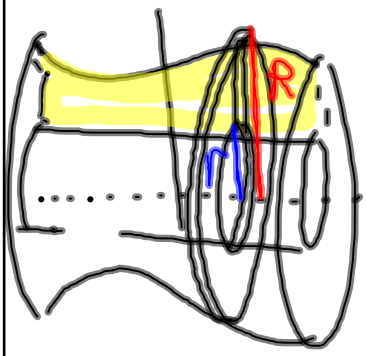
left right

$x = -2$, $x = 2$

rotate about the line $y = -1$ ($y = 0$)



$\hookrightarrow \int_{-2}^{2} \pi (2 + x\cos x)^2 dx = 52.4088$



$\hookrightarrow \in y = -1$

washer rotate around $y = -1$

$\int_a^b \pi R^2 - \pi r^2 dx$

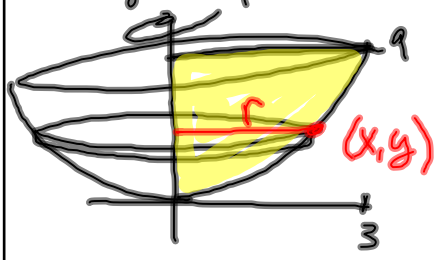
$\int_{-2}^{2} \pi \left((2 + x\cos x) + 1 \right)^2 - \pi \cdot 1^2 dx$

Jan 19-11:52 AM

$y = x^2$ $x=0$, $x=3$

~~x axis~~ $y=9$

rotate around the y-axis



$$\int_c^d \pi r^2 \, dy$$

another disk formula (horiz rect)

$r = x = \sqrt{y}$

r needs to be a function of y

$$\int_0^9 \pi \left(\sqrt{y}\right)^2 dy$$

Jan 19-12:14 PM